

Date: Wednesday, 5/16/2007 8:13:18 AM
User: Kim Johnston

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services
Job Number : 32374
Estimate Number : 11058
P.O. Number : *N/A*
This Issue : 5/16/2007 S.O. No. : *N/A*
Prsht Rev. : NC
First Issue : *N/A* Type : PURCHASED PARTS
Previous Run : 28389
Written By : *[Signature]*
Checked & Approved By : *[Signature]*
Comment : Est. C 02.11.26 Added P/O KJ

Drawing Name : 02.500 SUPPORT
Part Number : D28921
Drawing Number : D2892 REV A
Project Number : N/A
Drawing Revision : A
Material : *N/A*
Due Date : 6/5/2007

Qty: *2* Um: Each

Additional Product

Job Number:



Seq. #: Machine Or Operation: Description :

1.0 PG PURCHASING



Comment: PURCHASING

Issue P/O: *3795*

C207105117

(16)

Description: D6104-003

Material: 17-4 PH SS (AMS 5643 OR AISI 630) as per Dwg D6104

Material release note required.

Blank size makes (2) D2891-1

2.0 D6104003 17-4 SS Roundbar 3.25"OD



Comment: Qty.: 1.0000 Each(s)/Unit Total : 16.0000 Each(s)
Support

3.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Recieve & Inspect for Transit Damage

Ensure Material Release Note is attached

C207106105 (16)

4.0 MORI SEIKI MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI LATHE

Turn blank for Haas as per Folio FA082

2 B 02/06/04

5.0 QC1 INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

2 B 02/07/05

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
9/24/13	4.0	#1 support. Diameter of 2.524/2.529 was too small. Try to repost but come to big of 2.541.						
		#2 support: Dia. 2.524 & 2.529 was 2.533 and the support was too short.						
		#4 support: Too short the dia. make of 2.524/2.529 was too big 2.531 #2 support: the dia of 2.529 was 2.530						

NOTE: Date & initial all entries

Date: Wednesday, 5/10/2007 8:13:18 AM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 02.500 SUPPORT

Job Number: 32374

Part Number: D28921

Job Number:



Seq. #:

Machine Or Operation:

Description:

6.0

HAAS1

HAAS CNC VERTICAL MACHINING #1



Comment: HAAS

Machine as per Folio FA082

Tumble & Deburr

J.F. 07/07/05 (2)

7.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

J.F. 07/07/05 (2)

8.0

QC8

SECOND CHECK



Comment: SECOND CHECK

SA 07-07-05 (2)

9.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

P/O: 4102 C 07/07/05 (2)

-PRIME

-PAINT DELFLEET BLUE

-CLEAR DELFLEET

10.0

QC14

INSPECT SPRAY PAINT



Comment: INSPECT SPRAY PAINT

SA 07-07-09 (2)

11.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: IAN

SA 7/7/11 (2)

12.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

SA 07-07-12 (2)

Job Completion



W 07-07-12

DART AEROSPACE LTD		Work Order: 32374
Description: Ø2.500 Support		Part Number: D2892-1
Inspection Dwg: D2892 Rev. A		Page 1 of 1

Inspect dimensions highlighted on inspection sheet drawing D2892 Rev. A/DSK077 Rev. A and record below:

				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	5	6	7	8	By	Date
Lathe Section									
A	2.524	2.529		2.524	2.526	2.530	2.529		
B	3.702	3.722		3.703	3.710	3.709	3.710		
C	2.814	2.834		2.821	2.826	2.826	2.826		
D	0.718	0.738		.727	.732	.732	.730		
E	0.090	0.110		.095	.095	.095	.098		
F	2.714	2.734		2.728	2.724	2.728	2.726		
G	2.029	2.049		2.037	2.037	2.037	2.040		
H	3.214	3.234		3.227	3.227	3.227	3.226		
I	0.913	0.933		.925	.920	.920	.920		
J	0.022	0.042		.032	.032	.032	0.032		
K	0.090	0.110		.104	.103	.104	.095		
L									
HAAS Section									
AA	0.115	0.135		.132"					
AB	0.290	0.310		.300"					
AC	0.040	0.060		.044"					
AD	0.115	0.135		.125"					
AE	0.240	0.260		.250"					
AF	0.188	0.193	DT8706	Ø.188"			Ø.188"		
AG	0.240	0.260		R.250"			R.250"		
AH	1.126	1.146		1.146"					
AI	0.454	0.474		.464"					
AJ	0.240	0.260		R.250"			R.250"		
AK	0.053	0.073		R.053"			R.053"		
AL	0.257	0.262	DT8683	Ø.257"			Ø.257"		
AM	1.663	1.683		1.666"					
AN	0.053	0.073		R.063"			R.063"		
AO	0.022	0.042		R.032"			R.032"		
AP	2.779	2.789		2.788"					
AQ									
AR									
Accept/Reject									

Measured by:	J.F.
Date:	07/06/18 07/07/05

Audited by:	SA
Date:	07.07.05

Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	#

DART AEROSPACE LTD	Work Order: 32374
Description: Ø2.500 Support	Part Number: D2892-1
Inspection Dwg: D2892 Rev. A	Page 1 of 1

Inspect dimensions highlighted on inspection sheet drawing D2892 Rev. A/DSK077 Rev. A and record below:

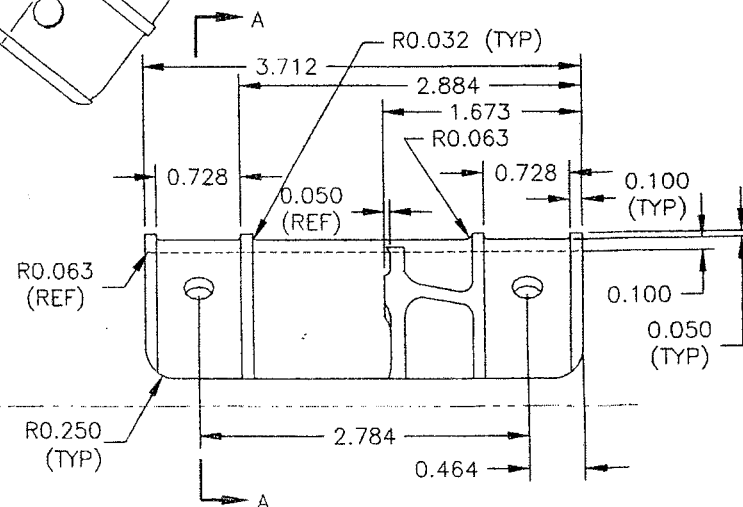
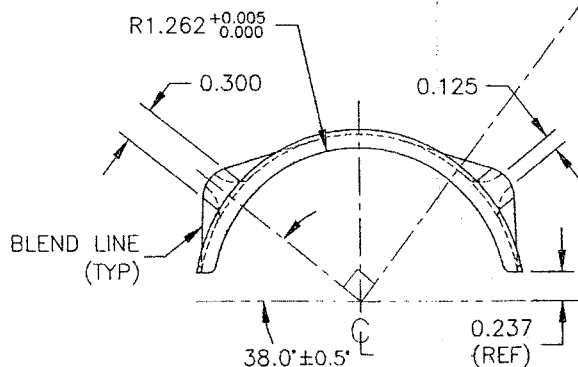
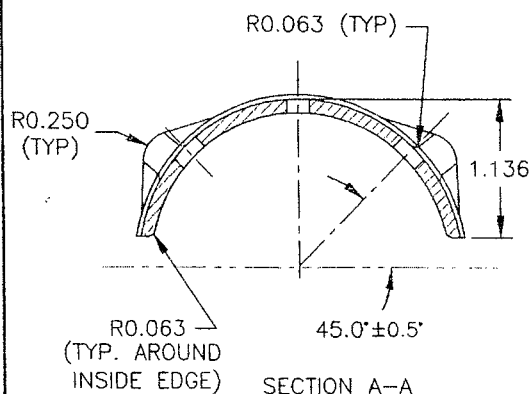
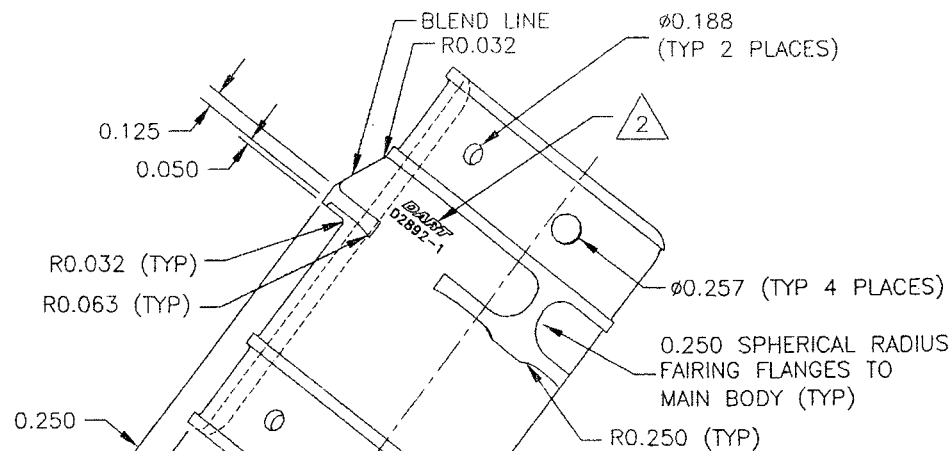
				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	9 ✓	101	113 ✓	124 ✓	By	Date
Lathe Section									
A	2.524	2.529		2.528	2.528	2.530	2.527		
B	3.702	3.722		3.710	3.709	3.707	3.704		
C	2.814	2.834		2.827	2.826	2.832	2.830		
D	0.718	0.738		.728	.738	.733	.735		
E	0.090	0.110		.100	.099	.098	.095		
F	2.714	2.734		2.727	2.727	2.727	2.727		
G	2.029	2.049		2.035	2.044	2.036	2.034		
H	3.214	3.234		3.228	3.226	3.228	3.229		
I	0.913	0.933		.930	.925	.920	.920		
J	0.022	0.042		.032	.032	.032	.032		
K	0.090	0.110		.101	.101	.101	.098		
L									
HAAS Section									
AA	0.115	0.135		.133"	.133"				
AB	0.290	0.310		.300"	.300"				
AC	0.040	0.060			.042"				
AD	0.115	0.135			.127"				
AE	0.240	0.260			.251"				
AF	0.188	0.193	DT8706		Ø.189"				
AG	0.240	0.260			Ø.250"				
AH	1.126	1.146			1.145"				
AI	0.454	0.474			.464"				
AJ	0.240	0.260			Ø.250"				
AK	0.053	0.073			.053"				
AL	0.257	0.262	DT8683		Ø.257"				
AM	1.663	1.683			1.671"				
AN	0.053	0.073			Ø.063"				
AO	0.022	0.042			Ø.032"				
AP	2.779	2.789			2.788"				
AQ									
AR									
Accept/Reject									

Measured by: J.B.	Audited by: S.H.
Date: 07/06/11	Date: 07/07/05

Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	J

D2892-1

- 1) MATERIAL: 17-4 PH STAINLESS STEEL
HEAT TREAT TO H900 CONDITION
(900°F FOR 1 HR, AIR COOL)
MIN UTS = 170 KSI (38 HRC)
- 2) IDENTIFY WITH DART LOGO (PER DART SUPPLIED GRAPHIC) AND PART NUMBER IN THIS AREA WITH 0.125 HIGH LETTERING 0.010-0.020 DEEP
- 3) BREAK ALL UNMARKED SHARP EDGES 0.010 TO 0.020
- 4) PART IS SYMMETRIC ABOUT CENTERLINE
- 5) TOLERANCES ARE PER DART QSI 018 (REF. X.XXX = ± 0.010) UNLESS OTHERWISE NOTED
- 6) ALL DIMENSIONS ARE IN INCHES
- 7) FINISH: POWDER COAT WHITE (REF. 4.3.5.2) PER DART QSI 005 4.3



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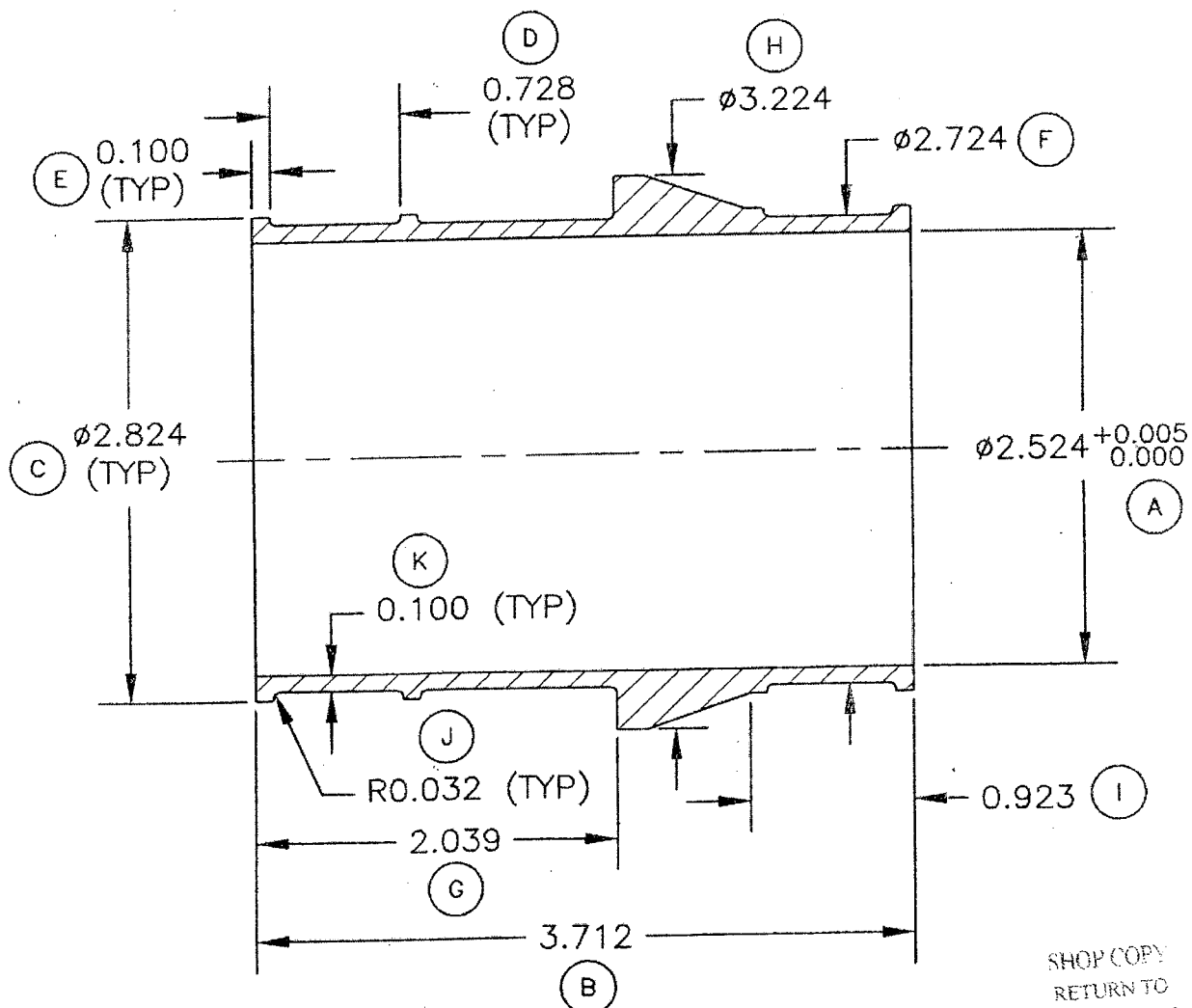
A	00.11.17	NEW ISSUE
DESIGN	DRAWN BY	DART DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED	APPROVED	DRAWING NO. D2892
DATE	00.11.17	TITLE #2.500 SUPPORT
		REV. A SHEET 1 OF 1 SCALE 1:1

NO. 32374
WORK ORDER
WITHOUT NOTICE
UNCONTROLLED COPY
ENGINEERING
RETURN TO
SHOP COPY



DESIGN H	DRAWN BY H	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED H	APPROVED H	DRAWING NO. DSK 077	REV. A SHEET 1 OF 1
DATE 03.05.20		TITLE TURNING DETAIL FOR D2892-1	SCALE 1:1
A	03.05.20	NEW ISSUE	

RELEASED
03.07.01



D2892-1 TURNING DETAIL

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EXPEDITION PAR SHIP VIA
NO. COM. CLIENT-CUST. ORD. NO. 3795
COMPTRE-ACCT. (VEND. SLS) 91037 200 40 CABANO (PPD)
F.A.B.-F.O.B. PREPAID
TELEPHONE 613 632-3336
H/C TAXE NO. COM. ORD 9 0 1 C/C
BILL NO. FEVIL/EMBALLAGE-B/L NUMBER
NO. PURCHASING AGENT
DA LADELLE

A SHIP TO: VENDU A-SOLD TO:
DART AEROSPACE LTD
127# ABERDEEN
HAWKESBURY ON K6A 1K7
INFORMATION CRÉDIT-CREDIT INFORMATION
Opéré par / Operated by: TRANSPORT TFI 5 SEC • NIR : R564638-6
ROUTE
01-NL-05/22
31-NL-05/25
INSTRUCTIONS/LIVRAISON-DELIVERY NO-E55353 INSTRUCTIONS LIVRAISON (CONT.)-DELIVERY (CONT'D.)
19048584-1
kingsway

DESCRIPTION - ITEM 1
2500 RD 17CR-4NI RT SOL. TREATED COND A 3.80" GOLD
CERTIFICAT DE CONFORMITE
See Packing Slip for English Certificate of Conformance
M. Castle & Co. (Canada) Inc. certifie que la material fourni après ce document rencontrera et est conforme aux spécifications du produit(s) décrit(s) ci-contre.
A.M. Castle & Co. (Canada) Inc.
INSTRUCTIONS
TOL + 1/8" - 0
PRIOR DIST/ORD: 01 931723
COULÉE INFO-HEAT INFO QTE-QTY
69723 ✓ DATE 20
A18564 600 11
A18289 1
INSTRUCTIONS (CONT'D.)
32x3825"
QTE/UNITE COM.-ORDERED 32 PCS PCS
POIDS COM.-WT. ORDERED 286
BALLOTS-BUNDLES 1 32
POIDS EXP.-WT. SHIPPED 286
FORME-SHAPE I.A.C.
42470
ENT.WH

DESCRIPTION - ITEM 2
TERMES ET CONDITIONS
PREPAID
DES AVANTAGES ET
RESTRICTION DE RESPONSABILITE
AU VERSO
INSTRUCTIONS
1 Box
COULÉE INFO-HEAT INFO QTE-QTY
INSTRUCTIONS (CONT'D.)
31-5-07
325502
QTE/UNITE COM.-ORDERED
POIDS COM.-WT. ORDERED
BALLOTS-BUNDLES
POIDS EXP.-WT. SHIPPED
FORME-SHAPE I.A.C.

DESCRIPTION - ITEM 3
S / Métaux Castle
835 Selkirk
Pointe Claire Que. H9R 3S2
306644 2
INSTRUCTIONS
1 Box
COULÉE INFO-HEAT INFO QTE-QTY
286 #
INSTRUCTIONS (CONT'D.)
QTE/UNITE COM.-ORDERED
POIDS COM.-WT. ORDERED
BALLOTS-BUNDLES
POIDS EXP.-WT. SHIPPED
FORME-SHAPE I.A.C.

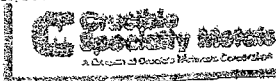
NOM (LÉTTRE MOULÉE)-NAME (PRINT ONLY)
RECU PAR-RECEIVED BY
DATE RECU-DATE RECEIVED
RECUIVRAISON - DELIVERY RECEIPT

06-06-'07 09:37 FROM-metalex castle

514-695-3281

T-635 P004/005 F-254

SP 435 50-A



P.O. BOX 977
SYRACUSE
NEW YORK 13201

CERTIFICATE OF TEST

S
O
L
D
T
O

A H CASTLE, INC

3400 N WOLF RD

FRANKLIN PARK, IL 60131

S
H
I
P
T
O

A H CASTLE, INC

3400 N WOLF RD

FRANKLIN PARK, IL 60131

CUSTOMER NO.

PS-121120-6-

DATE

02 13/07

CUSTOMER ORDER # & DATE

01-23347

CUSTOMER REQ. #

DISTRICT

B PARSONS

SHIPPED
FROM

SYRACUSE

DESCRIPTION OF MATERIAL

SIZE

3.250 RD

CRU 17-4PH RT A IAC 42470

AMC 3174-10 REV 7 ASME-SA564-04ED T630 ASIN-AS64-04 T630

AMS-56430 (EX SURFACE) AISI 430 UNS-S17400

CHEMICAL ANALYSIS

HEAT NO.

A18564

C
.034

MN
.68

P
.030

S
.018

SI
.45

NI
4.04

CR
15.20

MO
.11

CU
3.13

CO
.24

Fe
100

CASTLE METALS FP
DATE REC'D 3/9/07 IAC 42470
APPROVED BY: *[Signature]*

MECHANICAL PROPERTIES

QUANTITY

HEAT NO.

1187 # A18564

TENSILE PSI YLD. 22PSI

2ELONG40

RED/AREAX

HARDNESS
BHN 350

CAPABILITY PHYSICALS AFTER 500 DEG. F. - 1 HR. AIRCOOL:
203.660 160.640 12.6 53.3 BHN 410

MACRO TEST OK

FERRITE 3 %

MAGNAFLUX P/S = 0/0

REDUCTION RATIO: 27.511

MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 45 MINUTES AT TEMPERATURE -
AIRCOOLED.

CRUCIBLE MATERIALS CORP. VENDOR #18510.
MATERIAL INGOT CAST.
NAPTA - YES

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT
NO WELD REPAIR PERFORMED
MATERIAL MELTED IN U.S.A.

THANK YOU FOR SELECTING A QUALITY PRODUCT
MANUFACTURED BY THE EMPLOYEES OF CRUCIBLE SPECIALTY METALS

THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN ACCOR.
WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH
SPECIFICATION REQUIREMENTS.
CRUCIBLE MATERIALS CORPORATION
ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION

SWORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF _____, 20

CERTIFIED
BY:

QUALITY ASSURANCE REPRESENTATIVE

T-635 P005/005 P-254

CERTIFICATE OF TEST

06-06-07 09:37 FROM-metalex castle

SYRACUSE
NEW YORK 13201

DATE	03/11/07	TIME	11
SHIP TO	3400 N WOLF RD FRANKLIN PARK, IL 60131		
SHIP FROM	A M CASTLE, INC FRANKLIN PARK, IL 60131		
SHIP TO	A M CASTLE, INC FRANKLIN PARK, IL 60131		
SHIP FROM	A M CASTLE, INC FRANKLIN PARK, IL 60131		

DESCRIPTION OF MATERIAL
CND 17-4PH RT A INC 42470
AHC-3174-10 REV 7 AENE-84564-04ED 1630 A61M-A564-04 1630
AHS-84430 (EX SURFACE) A181 630 UNBS 817400

CHEMICAL ANALYSIS									
0.046	C	0.50	0.027	0.021	0.61	4.17	15.11	0.14	3.38
0.009	CB	0.27	0.009	0.009	0.009	0.009	0.009	0.009	0.009

CASTLE METALS CORP
DATE RCVD 3/15/07
IAC 4/1/07
APPROVED BY 17

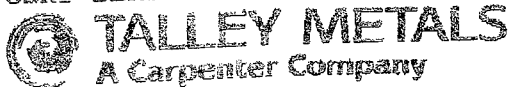
478 & A18289 TENSILE PSI YLD. 2XPSI XELONG2IN RED/AREA HARDNESS
CAPABILITY PHYSICALS AFTER 900 DEG. F. - 1 HR. AIRCOOL
204,770 179,890 13.8 52.6
BHN 415 BHN 363

MACRO TEST OK
FERRITE 3 %
INNOVATION F/B = 0/0
REDUCTION RATIO: 27.511
MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 45 MINUTES
AIRCOOLED.
CRUCIBLE MATERIALS CORP. VENDOR #18410.
MATERIAL INGT CAST.

THANK YOU FOR SELECTING A QUALITY PRODUCT
MANUFACTURED BY THE EMPLOYERS OF CRUCIBLE SPECIALTY METALS
MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT
NO WELD REPAIR PERFORMED
MATERIAL MELTED IN U.S.A.

SWORN TO AND SUBSCRIBED BEFORE ME THIS
DAY OF _____, 20____
NOTARY PUBLIC

LAURENCE J. WHITE - QUALIFICATION EXAMINER

CERTIFICATE OF TESTS
CERT SERIAL# 000479979


Talley Metals Technology, Inc.
 P.O. Box 2408

Hartsville, SC 29551 Tel: 843-335-7546 Fax: 843-335-6465

ABNAHMEPRUEFZEUGNIS
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12/10/04

CUSTOMER/RESELLER/CLIENT

SELLER/VERKAUFER/VENDEUR PAGE 1 OF 2

A.M. CASTLE & CO
 3400 N WOLF RD
 FRANKLIN PARK, IL 60131

NVL

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS
01-28383-01	W67226	12/10/04	9.150

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE : G9723

PRODUCT DESCRIPTION: TYPE 17-4 SOLUTION ANNEALED ROUGH TURNED
 PART NUMBER: IAC 42470

SPECIFICATION: CASTLE 3174-10 CAP OF COND. H900 REV. 5 (02/18/04)
 AMS 5643 REV Q (01/ /03) (UNS S17400) (AISI 630)
 ASTM-A564-04
 ASME-SA564 2001 EDITION

SIZE 3.250000 IN. (82.55 MM) RD BAR

PRIMARY HEAT CHEMISTRY (WT%):

C	MN	SI	P	S	CP
0.03	0.34	0.48	0.019	0.026	15.52
NI	MO	CU	N	CB	CP
4.42	0.29	3.61	0.032	0.25	0.01
CB+TA					
0.26					

THIS HEAT MELTED BY THE ARC/AOD PROCESSES
 NO WELD REPAIR.

MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM AND ALPHA SOURCE
 CONTAMINATION.

DISCS MACROETCHED AND APPROVED

HARDNESS AS SHIPPED, HB 321 (MIDRADIUS)

MAGNETIC PARTICLES FREQUENCY = 0 / SEVERITY = 0

MICROSTRUCTURE - FERRITE 1.60%

CASTLE METALS FC

SOLUTION ANNEALED 1900 F - 1 HOUR - RAPID COOL
 HOT REDUCTION RATIO: 8:1
 MATERIAL WAS MELTED AND MANUFACTURED IN THE USA.

DATE REC'D 12.15.04 IAC 42470

APPROVED BY

CONTINUED ON NEXT PAGE

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CERTIFICATE OF TESTS

CERT SERIAL# 000475979


TALLEY METALS
 A Carpenter Company

Talley Metals Technology, Inc.

P.O. Box 2496

Hartsville, SC 29551 Tel: 843-335-7540 Fax: 843-335-6465

ABNAHMEPRUEFZEUGNIS

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- THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE MADE IN REFERENCE TO THE CARPENTER ORDER NUMBER.
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12/10/04

CUSTOMER/BESTELLER/CLIENT

SELER/VERKAUFER/VENDEUR PAGE 2 OF 2

 A.M. CASTLE & CO
 3400 N WOLF RD
 FRANKLIN PARK, IL 60131

EVL

CUSTOMER ORDER NO./ENDVOLL-NR./N° DE COMMANDE	CARPENTER NO./WERKE-NR./N° DE REPONSE INTERNE	DATE/DATE/DATE	WEIGHT/GEWICHT/POIDS
01-28383-01	W67226	12/10/04	9158

HEAT NUMBER/SCHMELZE-NR./N° DE COULEE:

G9723

CAPABILITY

900 F(482 C), 01 HR

AIR COOL

YIELD STRENGTH, (0.20 %) KSI(MPA)	192.0(1324)
TENSILE STRENGTH, KSI(MPA)	202.0(1393)
ELONGATION IN 2.00", %	13.0
REDUCTION OF AREA, %	46.0
HARDNESS, HB	401.0

(CONVERTED FROM TENSILE STRENGTH)

 WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE
 PURCHASE ORDER AND SPECIFICATION REQUIREMENTS.

 TIMOTHY DUVALL
 QUALITY ASSURANCE REP.
 CARPENTER TECHNOLOGY CORPORATION

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